# COOP'S TECHNOLOGY DIGEST

## -A Timely Report on The World of Communications-

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COOP'S TECHNOLOGY DIGEST

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## The forgotten digital transition

With all of the technical, political and operational problems besetting the transition to digital television, another equally important digital changeover has been largely ignored. It would appear to be a matter of "*too much on the plate*," simultaneously.

Digital radio broadcasting (also known as DAB or **D**igital **A**udio **B**roadcasting) was developed parallel to the creation of standards for DVB-S (digital [video] broadcasting via satellite) and DVB-T (digital [video] broadcasting terrestrial). The goal posts were identical to the television development - at some future, unspecified, date all radio broadcasting (whether AM, FM or shortwave) would migrate away from analogue to digital.

Implementation of DAB on a planet-wide basis requires full replacement of all existing radio transmitters and all existing radio receivers. That amounts to more than 300,000 transmitters (exclusive of two-way radio systems) and as many as 3.5 billion receivers. The reasons cited for making such a change originally paralleled the reasons given for television's transition to digital:

1) Higher quality reception
2) Multiple audio (sound) channels from a single transmitter
3) Stereo reproduction for both AM and FM transmitters where only mono is currently practical
4) A claimed "better usage of the radio spectrum," reducing the overall number of radio transmitters required and thereby freeing up spectrum currently used for broadcasting for other (public safety, police) purposes.

There is presently no commercial deployment of DAB anyplace in the world; the UK comes nearest to this marker post with its own, uniquely British, approach to "digital radio." And as with the very muddled roll out of DVB-T, one of the primary reasons for the slow start-up of digital radio has been a lack of agreement for a transmission "*standard.*"

*There is a chicken and egg scenario at work here.* Before large scale deployment of digital radio can begin, there must be operating transmission services. Manufacturers of DAB radios for consumer use are not anxious to create specialised radio receivers for a variety of non-compatible DAB formats. And lacking a standard for transmission, we have totally different systems trialling in Germany, the UK, the US, Australia and elsewhere. Each, at this stage, requires a dedicated purpose-designed DAB receiver. It is no wonder that the first DAB receivers on offer in the UK were priced at more than 1,000 pounds each or that receivers in use in Germany cost 50% more than that high price.

The same challenge has slowed down introduction of reasonably priced DVB-T and HDTV (television) receivers. The American HDTV/8-VSB system has well reported and acknowledged technical problems, unresolved at this time. Between 50,000 and 100,000 American homes are now equipped for HDTV two years after introduction of the service; less than 1/10th of 1% of all US homes. Designers of reception equipment say that lacking public interest in the new technology, they are not prepared to devote their resources to creating lower priced, mass produced receivers. Consumers respond that as long as digital DVB-T offers no new programming and only marginally better image quality than analogue television, they are not rushing to acquire the high priced HDTV sets. Broadcasters counter that as long as there are so few receivers available and in use, they see no point in creating specialised programming available only on HDTV.

DAB faces even greater challenges. "CD quality digital reception" is a promotional phrase for the benefits of DAB but unfortunately it reminds consumers that if they want CD quality sound in their vehicles or home, they can go out and purchase a CD player today. Or settle for slightly less than "CD quality" and use the tape deck that comes as a companion to their stereo auto radio. Unfortunately for the sound creation people, there are several ways of achieving "CD quality sound" in a vehicle (or home or office) and none of them involve spending 1,000 British pounds for a specialised new receiver.

## The many routes to DAB

As with digital television, a number of different (and non-compatible with one another) techniques exist for creation of DAB. Place 100 qualified engineers in 100 laboratories and you will end up with at least 100 ways to deliver DAB. And once you have a "technique" working, there are ways to vary the deployment of that technique which are also incompatible with one another - even if they start off in the same manner.

Some new terms to memorise:

1) Eureka 147 - a DAB delivery technology developed for use in a never previously utilised for broadcast transmission band of frequencies (specifically, 1452 - 1492 MHz; yes, these are microwaves).

2) USA Digital FM-1 - a DAB delivery technology created for the (USA) FM broadcast band (88 - 108 MHz), using a technology that in theory allows both existing analogue *and* the new DAB to coexist using the same transmitter and the same frequency simultaneously (called IBOC for in-band, on-channel).

3) USA Digital AM - A similar technology for the AM broadcast band (IBOC).

4) AT&T/Amati LSB - Another FM broadcast band technology that uses the same channel for simultaneous transmission of digital and existing FM.

5) AT&T - Yet another system created to place the new digital service on an adjacent channel (such as 90.1 when 90.3 is the existing FM frequency), known as IBAC (in-band, *adjacent*-channel).

6) VOA/JPL - A direct broadcast satellite (DBS) proposal using a new set of frequencies (2310-2360 MHz) in the microwave region, transmitting from satellite to ground receivers.

Then we have a uniquely British system which has been in (test) service for two years using frequencies in the region of 220 MHz (roughly the same as our band III television channels in New Zealand and Australia). The British system is similar to - but not the same as - the Eureka 147 system but employs VHF (very high frequency) channels rather than microwave frequencies (1452 - 1492 MHz). The British were able to create a DAB service band within the VHF frequency region because all VHF television broadcasting was eliminated there more than a decade ago. This would be a far more difficult option in countries such as New Zealand and Australia where these frequencies continue to be used for television (in fact - Australia has created a pair of *new* digital TV channels in this very region of the spectrum).

## Interference

The original assumption, now nearing twenty years old, was that AM or FM could *coexist* in the same frequency band with DAB and there would be limited or non objectionable interference between the two. This was theory and when testing actually began it proved to be entirely incorrect. The theory held that if DAB could share the same frequency band, or even the same transmitter equipment, as conventional AM and FM, that DAB could be launched while over a decade or two the listening public would gradually replace analogue AM and FM receivers with newer digital (DAB) models. Then at some future date, the analogue transmitters could be shut down. Unfortunately this will not work.

Each of the systems highlighted (above) were set up at the Cleveland (Ohio) research centre operated by NASA (the Lewis Research Center) and each system designer was allowed to operate his transmission equipment for testing to follow. The tests sought to determine how much interference might exist between conventional AM and FM and their DAB replacements. The same tests created professional laboratory quality audio recordings of the actual reception of both the AM (FM) and the as received DAB transmissions. The musical selections transmitted were identical for all systems and the original masters were the benchmark reference for comparison after the tests. This comparison was conducted by the Communications Research Center in Ottawa (Ontario, Canada).

The purpose of the tests was to determine the basic digital audio quality produced by each system, the reliability of reception, and its ability to coexist with analogue stations (including the "host" analogue station). A group called the National Radio Standards Committee (NRSC) and the Electronic Industries

Association (EIA) created the engineering measurement techniques and each DAB system creator could also add additional tests which might favourably demonstrate the best attributes of a specific system. The DAB encoders and the DAB receivers were supplied by the system proponents. In effect, the systems were operated by their creators while the measurements were conducted by non-affiliated, independent experts not associated with any of the system developers.

Testing was done in two levels. The first was a laboratory environment where all factors including the reception conditions were under careful management. The second involved actually broadcasting the DAB signals off into the ether and going out to determine the quality of reception at various distances from the transmitter(s).

The Eureka 147 system was unique of those tested; only it was operated in a new frequency band established specifically for DAB. The balance of the proposed systems had to "share" or "coexist" with the analogue AM (or FM) transmitters already in existence. Documents (test reports) issued at the conclusion of testing came to the following conclusions:

1) USA Digital AM. This in-band on-channel technology produced results judged "unacceptable" even when the receiver experienced no interference and was located in an area of "high signal level." The audio recordings showed that "CD quality" was a misnomer and the audio quality was totally unacceptable even by a non-critical listener. If two AM stations on adjacent channels (such as 882 and 891 kilohertz) were using IBOC DAB, the station being listened to had to be 34 times as strong as the adjacent channel IBOC station or the receiver quit functioning.

This has particular ramifications for night-time service from high power stations (so-called clear channel AM broadcasters).

2) USA Digital FM-1 (and AT&T/Amati LSB). These are a FM equivalent of the USA Digital AM utilising the same radio frequency as an existing analogue transmitter. The test results reveals, "*IBOC FM DAB produces a significant impairment to the quality of the FM stereo audio for the 'host' analogue station.*" The IBOC results were also especially devastating to the first and second adjacent channels (if 93.1 is the host IBOC channel, 92.9 and 93.3 are the first adjacent channels while 92.7 and 93.5 are the second adjacent channels). When one IBOC transmitter was operated on 93.1 and a second was operated on 92.7 at standard geographical spacing as established for analogue stations, the actual service area of the analogue stations was reduced by 24% while the digital coverage areas were reduced by 32%.

Analogue FM is and always has been stifled by the presence of "multipath" reception. FM radio broadcasts in a portion of the spectrum where the relatively short wavelengths are reflected from hills, trees, buildings. This results in two or more separate pathways between the transmitter and the receiver (i.e. multipath). When the FM receiver is asked to demodulate (process) a second or third (etc.) analogue data stream from the same transmitter, it commonly fails or causes reception to "pop" in and out as the various "standing waves" clash with one another inside the receiver.

Multipath has also proven to be a serious problem with DVB-T reception and in America the multipath problem has been a significant (and as of yet unresolved) challenge to the launch of HDTV there. It is therefore not a surprise that DAB tests which encountered multipath recorded totally unsatisfactory results. With analogue FM and multipath, the reception pops in and out but seldom disappears totally for more than a fraction of a second with a moving vehicle. With digital, something quite objectionable occurs.

The digital data stream must be processed with a "timing device" and as the reception pops in and out, the timer sets, resets, resets again (and again) each time multipath occurs. At 60 kilometres per hour, the timing device is being asked to reset as often as 100 times per second. It cannot do this so it simply stops producing sound from the receiver until the multipath condition is gone. Then it requires, the tests found, from 5 to 9 seconds of "clean signal" to "reset" and play again. Unfortunately the same "reset" period (up to 9 seconds) was required when a station was initially tuned in, or when a listener was switching between DAB transmitters (stations).

3) AT&T. When it became apparent that in-band, on-channel was not going to work without significant reductions in coverage areas and unacceptable degradation to the host analogue transmissions, AT&T proposed and built an "adjacent channel" system for FM. The first adjacent channel is typically not in use

in the same region or market area because receivers are unable to separate stations operating so close together in frequency. Unfortunately, an FM band DAB transmitter generates "sidebands" which fall outside of their assigned channel, creating distortion (interference) for the adjacent analogue service. Moving the DAB transmitter to the second adjacent channel (two removed from the analogue station) improved but did not eliminate the interference situation. And it also created an impossible frequency assignment situation (managing simultaneously analogue and DAB transmitters two channels removed from one another).

4) Eureka 147. As most of the real world problems identified and measured with the IBOC and IBAC produced reception interference to existing analogue reception, reduced the service areas of analogue stations, and produced DAB coverage or service areas that were significantly (34 - 50%) smaller than their analogue counterparts, any DAB conversion plan that would allow simultaneous use of the same AM and FM bands seemed quite hopeless.

Eureka (and the UK system operating in the 220 MHz region) begin fresh with an entirely new frequency "band" for digital audio broadcasting. This of course means the original radio broadcasting business must be rebuilt from the ground up one more time; new transmitters, new receivers, new coverage areas, new economics, and new practical transmission and reception problems. Short of an unexpected technology breakthrough (which nobody anticipates), the original hoped for goal, an orderly transition to DAB from analogue as receivers gradually are replaced by consumers (driven by the expected improvements in digital audio over the existing analogue systems), is now lost.

In fact, the entire premise of converting from analogue AM and FM to digital now appears to have been lost. Which leaves Eureka 147 and others scrambling to find a reason for existence. As a business proposition, if all stations were going to be converting to DAB more or less simultaneously, and if the results were going to be superior to analogue, no other incentive for conversion was needed. But with the acceptance that DAB in the existing AM and FM broadcasting bands will not function as well as analogue, it appears the thrust of conversion is now gone.

This leaves the newer systems which will have to create a market for their services in new radio frequency bands on a less than enviable economic footing. It would be the same situation if all analogue TV was allowed to continue to operate (i.e., not turning off at a specified date) and DVB-T was forced to *compete* with it.

Eureka 147, using microwave band frequencies in the region of 1500 megahertz, has been tested with varying degrees of success in Germany, Canada, Australia and the USA. The broadcasting lobby has been opposed to 147 in the USA, anxious that if DAB is established in a microwave frequency band and all AM and FM broadcasters are required by law to move there, the present broadcasting business will be significantly disrupted. The UK experience with a lower frequency (VHF - 220 MHz) version of 147 is illustrative. Keep in mind the only significant difference between the "unique" British system and the Eureka 147 system is the operating frequency (VHF rather than microwaves).

The following is excerpted the February 2001 British Skywaves magazine:

"*Londoners, prickup your ears*!

"*Londoners' ears would be burning* if they could hear the plethora of radio services available on the capital's airwaves. This year, there will be about 35 digital radio stations on offer in the Greater London area, providing services ranging from financial news to literary reviews and chart hits to round-the-clock Frank Sinatra and Dean Martin. Most residents cannot yet receive these services without the right radio sets, but a rare display of collaboration between commercial and public radio sector is set to get listeners tuned in.

"*The Digital Radio Development Bureau*, a joint venture between commercial companies and the BBC, is embarking on a drive to market digital radio to consumers and help offset the costs of the new technology for manufacturers. The number of channels available in London is greater than any other city in the world, making it the centre of development for the medium, closely watched by rivals in the US.

"*Industry experts cite a far-sighted approach* by the government at the time of the last Broadcasting Act four years ago as a primary reason why the UK is far ahead of other European countries, which all operate on a common standard for digital radio.

"*Paul Brown*, chief executive for the Commercial Radio Companies Association, which is leading the establishment of DRDB, says: '*Legislation has put us in the position where we have the spectrum available and the licensing infrastructure in place. Why is it London? It is simply because 10 million people live there.*'

"*The Radio Authority*, the industry regulator, has generated interest by creating competition among rival radio companies to form consortia to bid for three local digital multiplexes. One multiplex is jointly operated by Capital Radio and Emap, while a second is owned by The Wireless Group, Clear Channel International, Scottish Media Group and Carphone Warehouse. A third licence will be contested late in 2001.

"Further motivation for radio companies to acquire digital licences and develop new service came from the regulator's offer to roll over an operator's analogue licence automatically if it owned a corresponding digital licence. With little or no financial outlay up-front, the risk for companies to put resources and energy into uncharted waters was minimal. However, there are questions about who is listening. The answer at this stage, say industry observers, is 'very few.' Although digital radio receivers are falling in price from an initial cost of 1,000 pounds to a present low end entry of 300 pounds, it is estimated that fewer than 30,000 sets have been sold.

"*The take-up is likely to be spurred* by further price falls as technology advances and as digital radio receives the backing of contiguous industries. Ford, the car company, has for example agreed to install digital radios as standard in new cars. Furthermore, it is difficult to measure audiences for digital radio effectively, an issue the industry will have to confront if it is to attract advertisers.

"*Commercial radio companies* are excited by the opportunities in digital radio and some executives offer a comparison with British Sky Broadcasting, the pay-TV operator controlled by Rupert Murdoch's News Corp, which bolstered its subscriber base by rolling over its analogue users to digital. Kelvin MacKenzie, chairman of Switch Digital and chief executive of The Wireless Group, said: '*In the early years, it will be all investment, but the digital world has shown that everybody - listeners, viewers, readers - wants choice. This way they are going to get choice.*"

The original proposal was to evolve DAB and then turn off analogue transmitters as the take-up of DAB receivers justified a shut down of the original AM and FM transmitters. The UK, to accomplish this goal, has at least a decade of busy-ness and challenge ahead. First, a national linked network of DAB multiplexed transmitters must be created. Next, an audience that is probably not that unhappy with their existing analogue services must somehow be convinced that spending money for a DAB receiver is in their best interest. Finally, the very important vehicle market (82% of all radio listening in the UK is in vehicles) must go much further than Ford planning to introduce DAB receiver options on select models of cars. The first DAB receivers will be add-on units, integrated with existing AM and FM receivers (nobody is suggesting DAB-only receivers at this point). When DAB is available nation-wide, the next step will be DAB-only receivers and then only if the familiar analogue services are also available on DAB as well. At some point government has to step in and issue a decree urging (or forcing) all radio listeners to upgrade to DAB with the threat of turning off the analogue service transmitters by a specified date. Think about it. A decade (ten years) might be a bit on the short side.

What we will have is a UK-unique DAB service, using Eureka 147 technology but in a frequency band not planned by other nations at this point (some European nations have shown an interest in the UK project, others are either not interested or simply not ready for any DAB conversion). The UK has convinced itself that if it pioneers DAB, as it pioneered television for Europe, it will create an "export market" for DAB transmitters, receivers and technology. That might be wishful thinking.

Meanwhile - why DAB?

The primary reasons favouring DAB over existing analogue are twofold:

1) "CD quality sound," and,

2) The ability to mix data with sounds to create a combination package of printed (displayed) text and sound.

"CD quality sound" depends upon a number of factors, not all of which have been field proven to date. The most frightening unproven is "multipath" or the situation occurring when the VHF or microwave signals bounce off of solid objects and arrive at the receiver location from different directions. One of these is the direct signal, all of the others are "echoes" and are delayed in time. In the presence of "echoes" the DAB service like its counterpart DVB-T simply refuses to function. Clever software still on the drawing boards promises to create a receiver that will know which of the many signals received is the real one and which are echoes but at this time, none of this is field proven. Eureka 147 testing in Canada and Australia essentially accepts this is a problem that has to be solved in a "cellphone" fashion - rather than one high power transmitter, Eureka 147 uses dozens, hundreds of separate transmitter sites for a city or metropolitan region. Just as a cellphone user is "passed from transmitter to transmitter" when moving around, the Eureka system locates a new low power transmitter every few miles along the highways and vehicles drive out of one coverage zone into a new one when moving. This greatly reduces echoes. But it creates a new logistics problem - hundreds of separate transmitters where with analogue one does the entire coverage area.

The UK approach is a cross between high power master transmitters and the Eureka cellphone site approach. It gets away with the cross bred system because while the DAB is a multiplex service dependent upon clean echo-free service to function, the VHF frequencies employed for the UK system are not as susceptible to multipath as the microwave frequency band planned for the original Eureka.

What all of this says is a lack of "standards" will inhibit world-wide growth of DAB for the foreseeable future.

Mixing data with sound is a second issue. Yes, digital data streams can easily and conveniently mix text (stock market reports, sporting scores, even paging services that address single receivers with messages) and sound simultaneously. It happens that analogue has an answer, a mostly little known system called RDS for Radio Data Service.

RDS uses the FM radio sub carrier (available whenever the FM station is transmitting in stereo) to include a "text data stream" along side the normal programming. RDS is invisible to the normal listener, does not adversely affect the station's coverage region or area, does not degrade the quality of sound for the FM broadcaster (RDS is not available for AM). RDS radio receivers were first introduced in the mid 1990s, and market surveys in Europe report something approaching 85% of all new vehicles sold there are automatically equipped with a RDS receiver. The RDS receiver looks like a standard AM-FM car radio until you turn it on. Then, if you are tuned to a radio station employing RDS, a text message suddenly appears on the receiver's front panel. RDS was originally developed in Europe in the late 1980s. RDS in the United States has been slower to catch on, perhaps because FM radio broadcasters there have been faced with a chicken and egg situation vis-a-vis RDS equipped receivers. Finally in 1997, RDS (called RBDS in the states) began to appear in selected models of vehicles (Audi - all, BMW - all, General Motors - Cadillac, Ford - 5 Ford models, 2 Lincoln and 2 Mercury), Jaguar - all models, Mazda - some pickup truck models, Porsche - all models and Volvo - two models. That was 1997 and you will note that the European based auto makers were the first to make RBDS an automatic feature - part of their experience in Europe where by 1997 more than 50% of vehicles already arrived with RDS included. Today, 90% of all European FM stations broadcast RDS.

RDS/RBDS is a multi-pointed sword. It can be used by the station for a simplistic "visual identification" which appears on the front display screen of the radio ("FM 105"), or it can be used in a variety of other ways to actually generate new revenue for the radio broadcaster.

The investment for the broadcaster is quite low - as little as US$450 will equip an FM broadcaster with a RDS "Mini-encoder" from a firm called Inovonics (Santa Cruz, California) and an all services version is US$2,500. The "all services" unit, connected through a typical IBM or Apple PC as a text creating device, will generate on the FM radio's display screen a variety of simple and complex text messages. The station operator can select which category of text message he wishes to RDS-transmit from the following list:

PS - Programme service name (e.g. "LIVE 105")
PI - Program identification (e.g. "Drive Time Reports")
PTY - Programme type (from a prepared cache of 31 categories; e.g. "Easy Listening")
AF - Alternate frequency list (up to 7 additional frequencies for affiliated transmitters)
RT - Radiotext - 32 characters maximum which scroll across the screen - in support of advertisers)
M/S - Music/speech switch (e.g. indicates music or speech only)
DI - Decoder ID (e.g. indicates mono or specific binaural/stereo mode in use)

By adding a dedicated PC and integrating the station's (music) play list with the RDS transmissions, individual song titles, artist names, even store names where the CDs or tapes are available can appear and scroll as commanded across the screen on the receiver as the tune is being played. Alternate options include a full text scroll of stock market reports, sport scores, news headlines. Virtually anything that can be reduced to a PC type keyboard can be transmitted using RDS/RBDS. In addition to the low cost RDS/RBDS mini-encoder, more complex packages capable of the longer and more varied text messages are manufactured by Modulation Sciences, CRL and RE America. Individual RDS/RBDS receivers can be equipped with "CA" (conditional access) identification and with this in place the broadcaster can sublet his RDS capability to a message pager or other one-way signalling firm. Pocket sized RDS/RBDS receivers that combine FM radio listening with message delivery are now available in Europe and North America. And like their DVB-S counterparts, some message service operators provide these receivers without *charge* to contract users of their message delivery services.

As the automobile manufacturers in the USA have come around to offering RDS in more and more models as "standard equipment," the number of FM radio stations in the United States using some form of this radio data service has grown rapidly. As of February 2001, there are now just over 1,450 FM broadcasters in the US using this technology - out of 7,000 licensed FM stations (http://www.members.aol. com/jpzondlo/nardslog.html).

The latest RDS equipped receivers offer a safety feature as well. Even if the car listener is using his CD or tape play functions, or has the radio turned totally off, if a radio broadcaster transmits an "Alert!" message, the screen pops alive with the text (a weather alert, traffic alert, some other form of emergency message). There is more. If the user will select from 24 different radio format categories the type of radio station he wishes to listen to ("Top 40," "All News," "Sport Talk"), the RDS system depends upon the station's own identification system to sort out which stations fit the requested formats. In this way entering a new city with new stations makes finding formats the listener prefers a one button push technology.

Where RDS/RBDS technology has been slow to catch on is with the home radio listener. Perhaps that is because in most countries someplace between 75 and 90% of all radio listening is done out of the home. Only a handful of fixed-location receiver manufacturers (such as Grundig out of Germany) have evolved home style radios with RDS/RBDS features. In the home, the assumption to date has been that people who want to read or follow text are going to use a television set or PC while in the car, there is a "captive audience" where TV and home PCs cannot yet go.

Ultimately?

Is DAB viable? With present technology, it is only technically possible if you begin with a clean slate and build DAB transmission systems utilising frequencies not otherwise in use. Finding such frequencies on a world-wide basis (for a "standard service" that works everywhere as AM and FM do) is no longer possible - all of the acceptable frequency bands are in use by well established services. The Eureka 147 system, planned for the lower microwave regions between 1400 and 1500 megahertz, is an example. The only way to cover a metropolitan area with microwave frequencies is to build dozens or hundreds of transmitters to blanket a city or rural region which VHF or UHF now envelope with a single transmitter.

The early dream that AM/FM and DAB could coexist in the analogue broadcasting bands is now a dead issue. That does not mean it is forgotten nor that nobody will try again. But the tests conducted eliminate this as a possibility for the present.

Bottom line: DAB is probably dead as well, there is unlikely to be a transition to digital audio broadcasting and analogue will be with us for many decades to come.

# TECHNOLOGY BYTES

## February 28, 2001 - Part of CTD#75

### Satellite TV & Radio

**Confidential memo** from the bowels of Cable & Wireless Optus. You say you want to lease transponder space from Optus to reach an Australia or Australia + NZ wide audience equipped with appropriate Optus Aurora approved satellite receivers? Here are some costs. A 64kbps mono audio channel will cost you Au$40,000 per year, 3 year contract, + GST. You deliver your audio material to the Optus uplink station at the Rochedale (NSW) Earth Station, they do the rest. There is also a $5,000 set-up fee. Other options: 128 kbps bandwidth at Au$70,000 per year or 192 kbps at Au$105,000 per year. Optus provides "MPEG2 encoding" (they are not claiming DVB compliant in this memo), Muxing "with other channels," encryption, "basic management service." The total bandwidth is not available to the user however - some is reserved for the Optus data stream "overhead" management. Receivers to be authorised must be "Optus approved" which at the moment means UEC 642/700 series of ADB (SMS) series now available through Hills Industries. Same memo claims "38,000 smart cards in database" but other studies suggest total number of Optus authorised receivers is between 50,000 and 55,000.

**Mystery "Primestar" approved by ABA** for pay-TV in Australia. The Australian Broadcasting Authority has approved an application from a firm calling itself "Primestar Communications Australia Pty Ltd" (contact is Robert Porter, [61] [0]2 9908 8861). According to the ABA release, Primestar "*has indicted it proposes to deliver a range of programs including subjects such as sports, movies, entertainment, documentaries, information, news, cartoons, education, music and youth culture*." Mystery? Exactly "who is Primestar?" Firm with same name operates under massive umbrella of USA's DirecTV and DirecTV is present acquisition target of UK based News Corp (operator of BSkyB there). Australia regulations prohibit one "person" (corporation) with a foreign base from owning or controlling more than 20% of a pay TV broadcasting licence, and two or more "foreign" identities may not own or control more than 35%. A total of 70 channels was approved by the ABA.

**Australian ABC has signed agreement** with Cable & Wireless Optus for use of satellite space to deliver three channels of SDTV programming, datacasting or one channel of HDTV to all ABC sites nation-wide. The new contract covers a ten year period.

**As of today** (February 28), French Polynesia's RFO service on Intelsat 1701 (180E) will transfer to I702 (176E) with the 180E service scheduled to shutdown permanently on March 17. The parameters are identical to the 180E (4026.9 LHC, Sr 4.556, 3/4).

**UniSat,** the Auckland University unique system that employs four sizeable satellite dishes to keep track of ethnic state-of-origin TV programming for distribution to various campus groups, is approaching its 7th birthday. The University pioneered satellite TV as an educational tool for language, economic, art, law and other study paths, now has dishes between 3.5 and 7.3 metres in size, 18 satellite receivers (11 of which are digital). The reception is taped for later use by the University as well as delivered through a video server with up to ten channels active at any one time. And although live use by students and departments has grown remarkably, tape delayed distribution has shown a surprising strength rising from 1229 tape hours in 1995 nearly 3500 in 2000. Heaviest user is the Arts Deparment (86% of all recordings) led by French (32%), Political Studies (17%), Italian (11%), History (9%), Russian (7%), Japanese (6%) and Chinese (5%). Through a cable network connecting to the Library and Student Health waiting room at the Tamaki Campus, 12 television channels are on view for students and guests. Brian M. Oliver spearheaded the project in 1994, remains the manager in 2001.

**Intelsat plans** a "super capacity Ku band satellite" at 85E (to be called APR-3) in first half of 2002. China's Sinosat has acquired rights to use 6 transponders plus two of Intelsat's C-band transponders at 178E after October 2003. Intelsat has 10 satellites currently on order, all to be launched between now and the end of 2004.

**Portugal's RPTi**, a mainstay of AsiaSat 2 analogue from their launch, has shut down; continues to operate within European Bouquet managed by DW.

**Sky Network NZ** has been conducting FTA tests using the 12.671 transponder (Optus B1, Vertical), as many as four FTA channels load with a non-SKY-CA receiver; apparently a part of their ongoing tussle with TVNZ + Telstra-Saturn.

**Spain's RTVE** (Radio Television Espanola) is actively courting pay-TV, cable, SMATV operators for carriage of their AsiaSat 2 available service. RTVE is one of 6 national networks within the European Bouquet, is FTA digital and has companion radio station services as well. Maria-Jesus Perez (e-mail contratos_canales_inter.ep@rtve.es) advises, "We now have two TV channels available for distribution in your area; TVE (generalistic, based on our two own terrestrial channels, including films, sports, news, series, sitcoms, cultural and educational programming in the Spanish language), and, 24 HORAS (a 24 hour news channel in Spanish). The advisory also notes, "RTVE has no commercial aims. Thus, our international programme does not include any kind of advertising. Please note that in addition we re making a big effort to improve the contents and variety of our offer. On the other hand, our language is *soon to be the second* most widely spoken one and we are prepared to be the best." Could *French* be number two?

## Digital Television & Radio

**What consumers are being told** about HDTV failure in USA. The following article appeared in Business Week (USA) for February 2. "HDTV: Don't Blame the FCC for Tuning Out by Dan Carney. The nation's broadcasters are hopping mad. On Jan. 22, in a ruling pushed hard by its incoming chairman, Michael K. Powell, the Federal Communications Commission rejected their wish to have cable companies carry both digital and analog signals from local TV stations. Since 1996, when they were 'loaned' tens of billions dollars of spectrum for digital TV, broadcasters have been struggling to develop something people would watch in an era of satellite, DVD, and cable's own digital products. To jump-start the new era, they hoped the government would force cable companies to carry whatever they dished out. Enough is Enough - Broadcasters have had years to sell the format. But only a few viewers care. No such luck. The FCC's decision is a likely harbinger of further hands-off policies. and it tells the broadcasters that their original plan for digital TV - airing movie-quality images known as high-definition television - is going nowhere. The whole field is 'a train wreck in slow motion,' says David E. Mentley, senior vice-president at Stanford Resources, a display research firm. Now, the broadcasters have to come up with plan B. Save you tears: the FCC did the right thing. *The effort to create HDTV is perhaps the biggest blunder of 20th century communications policy.* The concept dates back to the late 1980s when broadcasters convinced Washington that a massive public-private venture was necessary to enhance American 'competitiveness.' But by the time spectrum was awarded to broadcasters, it was clear HDTV wasn't the best use for it. The spectrum could instead by subdivided into multiple digital channels, or used for wireless communications and other applications. Because of incessant technical and political squabbling, none of these uses has come to pass, and precious bandwidth is going to waste. Why? To hear the broadcasters tell it, the problems include a lack of good digital TV sets, copyright issues and most importantly, the intransigence of the evil cable companies, which reach 68% of US homes. But the truth is the broadcasters haven't come up with something people want. Sales of high-end TVs are taking off, thanks to hot satellite services and movies on DVD. But hardly anyone is watching over-the-air digital broadcasts in those few markets where they actually exist. All of this, notes former FCC Chief of Staff John Nakahata, stems from a simple fact: For this industry, there's no cost in doing nothing. 'If the broadcasters bought their spectrum at auction, like everyone else, they'd have a plan by now,' he says. By helping nix the digital 'must-carry' policy, Powell put the broadcasters on warning. The networks, however, aren't likely to go away quietly. 'This fight is far from over,' says National Association of Broadcasters President Edward O. Fritts, who vows to go straight to Congress. But Powell will do us all a favor by standing up to an industry too accustomed to getting its way in Washington."

**Arizona Senator John McCain** (yes, he was a candidate for US President) begins formal hearings into the status and failure of HDTV in the United States on March 1. Under US law, 1,288 commercial TV stations are required by the FCC to begin HDTV operation before May 2002 but to date only 182 stations have actually begun digital broadcasting.

**Australia's DVB-T set-top world** now has competition. Satellite set-top box importer/distributor Skyvision (skyvision@skyvision.com.au; (0)2 6292-5850) has begun field testing of Au$599 suggested list price set-top box which appears to be superior to the 7-9-10 network promoted Thomson box in every way, including price (Au$699). The Skyvision set-top is Korean designed and manufactured, covers the full VHF and UHF unique-to-Australia TV channels, has auto scan and auto seek station locating, S-Video + composite + RGB outputs, channel editing and favourite channel memory functions.

**It is the Nokia Mediamaster** DVB 9820T which was modified in a small quantity (40 total units) for carefully placed use by Australia's broadcasters prior to arrival of the French built Thomson set-top boxes. The modified sets have 7 MHz channels (VHF and UHF) per the Australian standard; rumours persist Nokia will enter the Australian DVB-T set-top market "mid year" with a commercially adapted version at Au$699. Experience with Nokia in the past suggests this is highly unlikely although the 2k and 8k capability of the Nokia DVB-T box makes it a very attractive if idealistic solution to the Australian market challenge.

**Maybe not part** of the Australian DVB-T tangle but amusing - err, insightful, none the less. From the Sun-Herald newspaper February 11:

> "Optus chief Chris Anderson left no doubt what he thought of Professor Allan Fels or Communications Minister Richard Alston in his address to the Israel Chamber of Commerce. After revealing his fast learning curve for troublesome telco acronyms, Anderson pointedly added the Professor's ACCC to the list. But it was Communications Minister Alston who got the biggest serve. Asked what he would say to Alston if he had a minute alone with him, Anderson paused thoughtfully before saying: *'It would take longer than a minute.'* So either there's more than a minute's worth of telco acronyms, or the minister is a bit, er, dense."

**Australian consumers are trialling digital TV** (DVB-T) in numbers totally unexpected. As CTD reported in our previous issue, various rental firms are offering a combination set-top (digital) box and 16:9 SDTV receiver for typically Au$24.90 per week (Au$1294.80 annual). Radio Rentals reports an average of 120 telephone calls per day, so many they have discontinued advertising and placed an order for an additional 400 set-top boxes.

**Australian contacts for broadcasters** now operating with digital services. NSW: In Sydney, Channel 7 is operating DVB-T on channel 6 (hereafter 7A/6D) and engineering contact is 02-9877-7709; Channel 9 is 9A/8D, 02-9906-9999; Network Ten is 10A/11D at 02-9650-1010; ABC is 2A/12D at 1300 139 994; SBS is 34D at 1800 500 727. In Queensland: Seven is 6D at 07-3369-7777; Queensland Television (9) is 8D at 07-3214-9851; Ten is 11D at 07-3214-1010; ABC is 12D at 1800 522 288; SBS is 36D at 1800 500 727. In South Australia: Seven is 6D at 08-8342-7777; Channel 9 is 8D at 08-8267-0111; Network Ten is 11D at 08-8267-0700; ABC is 12D at 1300 139 994; SBS is 33D at 1800 500 727. In Victoria: Channel 7 is 6D at 03-9897-7502; GTV (9) is 8D, no contact number provided; Network Ten is 11D at 1300 139 994; SBS is 29D at 1800 500 727. In Western Australia: Channel Seven is 6D at 08-9344-0777; Swan TV (9) is 8D at 08-9449-9999; Network Ten is 11D at 08-9345-1011; ABC is 12D at 1300 139 994; and SBS is 29D at 1800 500 717.

**UK report shows confusion** over DTV services. One in four homes has embraced Digital TV in the two years since the first digital service launched, but still don't fully understand how to make use of its services, according to Continental Research's latest Digital Report. "*Although some 12 million adults have Digital TV* in their homes only five million are aware they have online access via their Digital TV system. An even smaller number, 0.9 million use any of the online services available via their Digital TV. This compares with 10.7 million adults who go online via a PC in their home. There needs to be some serious educational marketing if consumers are to understand the fact that they can go online via their Digital TV. It is part of the initial contract for most pay TV services that the set top box is connected to a telephone line. This is crucial for cable, as this is the way TV programs get to the set (sic), but for digital satellite and ONdigital, telephone connection is meant to be mandatory. However, many consumers say that this is not the case, which may be through lack of awareness that the set top box actually is connected to a telephone line, or it may be that there is indeed no connection. Without a telephone connection, online services such as Open cannot be fully accessed. When asked about future use, just 0.7 million said they were definitely/probably planning to use Digital TV's online services, and more worryingly 3.5 million of current Digital TV subscribers said they were not planning to use the services. The big break in the market was June 1999, as until then, digital set top boxes cost up to £200. After that date both Sky and ONdigital gave them to the public free of charge, which triggered the market to take off. Demographic Profiles Consistent with our previous reports, younger households, and families with children still constitute the bigger audience for Digital TV. Share has changed since the introduction of digital cable services, seeming to affect digital terrestrial TV more than digital satellite. Just under three quarters of those taking Digital TV opt for satellite. Use of additional digital TV services as well as online services and other services offered by digital TV were also examined. Pay per view movies and listening to the radio via Digital TV were the most popular services. Continental Research also produces reports on Internet and Digital TV usage in the UK. Sections of these explore online usage from either a PC, WAP phone or via a Digital TV set. The penetration and profile of people using any method to go online is reported in detail in a separate Media Convergence Report found at www.continentalresearch.com."

**British DTV receivers**. BREMA (British Radio and Electronic Equipment Manufacturers Association) reports 120,000 DTV capable television sets sold through end of 2000 (90,000 in the year ending). This is in addition to just over 1 million DVB-T set-top boxes sold or given away free by ONdigital. To improve DVB-T penetration, BBC is considering whether to use annual licence fees paid by viewers as funding for massive give away of set-top boxes. February 13th Guardian (newspaper) reported a government plan to "trial" give away DVB-T systems in lots of 1,000 as a way of determining whether the technical difficulties with such a plan are solvable. The "pilot give-aways" are to be operated by a partnership of the digital television industry and the independent television commission. A clarifying report appearing in The Guardian for February 16th suggests that if such a project is launched, it will have "limited government participation" and will be an initiative of industry, not government. A major concern of Chris Smith, Culture Secretary, is that if such pilot projects are begun, how this will impact on consumers who might otherwise arrange for their own DVB-T equipment. "*This would have the effect of making people wait before switching over*" he believes. Numerous UK studies indicate that something over 20% of all UK homes will not act on their own to convert to digital and before the analogue services can be switched off, this "analogue-only-forever" group must somehow be motivated to switch to digital. The UK announced analogue switch off date is variously 2006 through 2010 depending upon which politician and which forum deals with the issue.

**Singapore has launched DVB-T** in a most unusual way. DVB-T transmitters and programming material are only available to riders of the country's 1500 buses, will not be offered to homes until late this year. It is a clever marketing move because over a period of a month an estimated 24% of all Singapore residents ride at least one bus. In six months time, an estimated 84% ride a bus at least one time. The Singapore DVB-T receivers have been installed in the buses to provide "TV MOBILE" with a mixture of news, information and advertising. Main transmitter sites are augmented by SFN (single frequency network) relays scattered where direct reception may be poor. The service was launched February 14th supported by "I Love DVB" bumper stickers and sign boards. The mobile adapted DVB-T system was designed and installed over a two-year period by British NTL, uses a QPSK format signal.

**Japan seems to have finally** put DVB-T into focus, plans a complete conversion by 2011, launching service in Tokyo, Osaka, Nagoya by 2003 and nation-wide by 2006. A new 1,968 foot transmission tower is planned for central Tokyo in support of the new service. DVB-S is already operating in Japan, accounted for sale of 400,000 digital TV receivers there in 2000, expected to rise to 2 million by 2002. Sky Perfect TV, DVB-S, claims 2.52 million subscribers while digital + analogue competitor WOWOW has 2.62 million.

**Thailand trials of DVB-T** have begun using system designed and installed by UK firm NTL. NTL trials are tests, not supported at this point by either of the major terrestrial networks nor by the National Broadcasting Commission. No frequencies for DVB-T have yet been allocated.

## Cable/MMDS/Pay-TV

**Status report Telstra-Saturn cable TV** in Auckland market. T-S apparently plans two separate Auckland area "centres," a North Shore location has not been announced but new signage at 952 Great South Road (Penrose or Onehunga; opposite end of Church Street where it intersects with the Great South Road) proclaims: "Telstra Saturn Telecommunications Centre, RB Steel main contractor, Telstra Saturn project management Martel International, Studio of Pacific Architecture, Dunning Thornton Consultants - structural engineer, Sinclair Knight Merz - Services engineer, Boffa Miskell - planning and landscaping; another exceptional development by Building Solutions." Meanwhile burial of fibre optic lines and coaxial cable is progressing in the following areas: Great South Motorway, approaching Ellerslie at this time. On the northern end of Auckland, burial is located from Greville Road to the north but is not expected to go past the Albany business development park initially. Also along the Northern Motorway, T-S is crossing St Mary's Bay to the Victoria Park viaduct. In the north-western quadrant, T-S appear nearly finished with the section between Lincoln Road and the end of the existing motorway. At the city end of this motorway T-S has begun construction from Bond Street westwards. On the section from Western Springs to Pt Chevalier, T-S are running down Great North Road apparently because this section of the motorway is nearly solid rock which would slow down progress.

**Telecom NZ has acquired a 12% stock interest** in Sky NZ Network in an apparent bid to have influence within the Sky Board of Directors. Telecom and Sky have also inked an agreement to allow the bundled sale (offering) of a combination television/internet/telephone package to be marketed by both firms. There is no technical connection between the new joint offering - this is simply a marketing plan that combines separate services from two distinctly separate companies.

**Sky NZ latest financial results**. Six month loss through December 31 was NZ$19.6m, more than 4 times the loss for the same period of 1999. However, Sky added 20,000 subscribers during this period moving total terrestrial/satellite subscribers to 397,000. Citing heavier new digital subscriber penetration which translates to an increase in set-top box depreciation numbers, spokesperson said, "*Within the next couple of years we should get close to making a profit if the growth continues. We could make a profit relatively quickly by just stopping growth, but strategically that would not be the right action.*"

**Sky's pay per view offering** ("Sky Box Office") is having problems with customers who are ordering but not agreeing to pay for the movies. An advisory dated 13 February to all installers reads (in part):

"As you are probably aware a number of subscribers are still making ippv bookings without realising or their children are doing it when they are not around as they know the pin number 0000 and the customer has not changed the PIN number (to one that is unknown to their children - ed). Could you please reiterate to the technicians the importance of checking to make sure the Pay Per View password is turned on and that the customer has changed their PIN number from 0000 to one no one else knows? Some customers are telling us that 0000 is widely known at their child's school which is concerning when they are able to book R18 material. We are working on a bill stuffer to again try and make customers aware of the importance of setting their PIN and turning the password on."

**And this classic memo** issued by Ian Hughes at Comet Installations:

"Austar has recently brought to my attention one of Comet's installers had broken or lost their crimping tool and apparently had trouble locating a shop that stocked a set of new ones. Therefore, the installer decided to continue to install for 2-3 weeks using a pair of pliers to crimp connectors. The installer was still installing using pliers until Austar quality checked one of the installs and asked why he was using pliers. I would like to express my view on this issue and make my position in regard to this matter perfectly clear to all installers. (1) There is no excuse to use pliers to crimp connectors. If you can't buy a set, don't install. (2) We are paid to do professional Pay TV installations. (3) If any installer/contractor is found at any time in the future to have crimped a connector with a pair of pliers, that installer/contractor will be terminated immediately and back charged for every job that is required to be rectified. (4) I suggest all installers carry a spare pair of crimpers as they are possibly the most important tool you carry. (5) If you run the risk you will get caught and you will be terminated. (6) There will be no exceptions. If you break or loose (sic) your crimpers, let us know and stop working immediately." Well, at least he spelt crimper correctly.

**BSkyB numbers** as reported mid-February for quarter ending December 31: Total subscribers 9,750,000, increase of 512,000 in prior quarter year. DTH subscribers (balance are via cable TV contracts) - 5,051,000 up 328,000 in quarter (5.25m homes as of February 6). Average revenue per DTH subscriber UK286, an increase from 281 pounds in prior quarter. The top tier DTH Sky World package is taken by 59% of all subscribers. Annualised churn (number of subscribers dropping service) held steady at 9.8% (or 1 home in ten).

**TVNZ + Telstra-Saturn satellite update**. There are problems with the T-S selection of a set-top box. As detailed in SatFACTS Monthly for February 15 (p. 32), T-S continues to insist on use of a 5 year old IRD manufactured by Pace Electronics (UK) for Australia's pioneer satellite pay-TV firm, Galaxy. Apparently T-S (or more appropriately, Austar as parent of Saturn) has tens of thousands of these used set-tops in warehouses with a depreciated book value of between Au$80 and $100. This IRD has no modem inbuilt, cannot be used for interactive (Open TV) purposes which is one of the primary reasons why TVNZ signed on board with Telstra-Saturn. A more serious problem arose late in January when it was discovered that the Divicom brand multiplex equipment which has been selected for the joint pay-TV and FTA venture does not readily function with these Pace set-tops. Cartons of Pace DGT 400/512 receivers have been shipped to Divicom where software technicians and receiver folks are attempting to get through this challenge. It is not a matter of whether Divicom can make the Pace receivers work with their unique data stream - they can - but rather whether in making this happen there are other serious penalties for the proposed service. Divicom is a non-DVB-S compliant MPEG2 data stream, has been at odds with the Optus Aurora project for more than two-years over just this problem. Optus has co-operated with Divicom by insisting that only Optus approved receivers be used with their service - the Pace DGT 400 is not one of those. Where is this headed? If Divicom cannot modify their data stream to suit the DGT400s, then T-S insistence they use low cost set-tops is a dead issue. If they can make it work, that still falls short of the TVNZ requirement that set-tops be capable of Open TV (two-way modem connected) dialogue with the programmers. At this point the launch of TVNZ + T-S is set back by at least one month (into late May) and more likely sometime in June. This joint venture project is not out of the woods yet, could easily evaporate or turn into two separate services - one operated by T-S using Pace boxed and a second under the mandate of TVNZ using more modern set-tops with two-way communication possible.

**Meanwhile, TVNZ's chief technology manager** for the TVNZ + Telstra-Saturn joint venture project, speaking before forum in Auckland, told the group: "*The joint venture has yet to finalise a supply of set-top boxes but (the one selected) will include a built-in modem to connect to the customers' phone lines.*" Perhaps, but on same day Lambourne was addressing Television @Evolution meeting, Telstra-Saturn CEO Jack Matthews was having a private lunch with leading stock market analysts in Auckland, where he told group, "*We have definitely decided on using the Pace set-top box for our satellite service.*"

**Cops will be cops department**. New Bedford (Massachusetts) police trying to figure out why three televisions at a station were receiving cable programming including sports and adult-entertainment channels for which the department had not paid. *"It's inappropriate, it's embarrassing, it's unacceptable and it's definitely not going to be tolerated,"* Chief Arthur J. Kelly III told The Standard-Times newspaper. The programming was received through "black boxes," converter devices used to receive a signal on most older televisions. Cable provider AT&T Broadband discovered the black boxes during a service call Feb. 9 at the department's South End station. AT&T informed Deputy Chief Carl Moniz, who had two black boxes removed from the station. After further investigation, the department found that a third black box had been rigged in a break room for vice and narcotics officers. The cable company also removed that box. An AT&T spokeswoman, citing privacy concerns, would neither confirm nor deny that the police department had been stealing cable. The police chief said he did not know when the internal investigation would be completed. He said the department wanted to find out if the black boxes were obtained during the course of police work or whether they were purchased or rigged illegally by officers themselves. *"I expect this is going to take some time,"* Kelly said. *"We need to talk to a lot of people."*

## Consumer Electronics

**The following report** appears in New Scientist for February 21. "Motorola has devised a way to stop televisions, cell phones and VCRs working if they have been bought on the 'grey' market. The technique allows manufacturers to shut down unofficially imported electronic goods. But European free-trade rules may outlaw the system. Manufacturers often set different prices for their goods in different countries, but unofficial importers can undercut these prices. Now Motorola's European research laboratory has found a way to thwart these grey imports by fitting equipment with a device that secretly checks where it is. The plan is to embed chips into TVs and cellphones that are either linked to the network of Global Positioning System satellites or are programmed to identify the signal transmitted by national broadcasters. If the chip detects that it is somewhere outside a pre-programmed region, then the equipment will stop working and be 'rendered useless,' says the company's patent. 'It is often desirable to control the marketing or use of products differently in different areas,' continues Motorola's patent, but the company would not comment on the scheme. However, European Union laws encourage free trade between member states. 'We would certainly investigate the Motorola scheme if there were a complaint or we thought it were anti-competitive,' Britain's Office of Fair Trading told New Scientist. Last week the OFT began investigating record companies it suspects of blocking parallel imports of cheaper CDs from other EU states. Consumers and some importers also oppose Motorola's scheme. 'We would absolutely resist anything that stood in the way of giving shoppers the best value through legitimate and legal purchasing,' says Colette Blanchfield of the British supermarket chain Asda. Jenny Driscoll of Britain's Consumers' Association, which campaigns for parallel imports on everything from cars to toys, says: 'If traders can purchase abroad they can reduce prices by up to half.'

## Terrestrial Broadcasting

**Three sources for additional** technical information on RDS.RBDS: http://www.rds.org.uk/rdsfnewsworld00.html; http://user.online.be/fmradio/deco.html; http://members.aol.com/jpzondlo/nardslog.html.

**Canadian native Americans** (Indians) have created their own "broadcasting regulatory agency" and now FM radio stations "assigned" by this group are appearing on the air from within Indian reservations there. An example: Station CKWE (Kwe which is pronounced gway means hello in Mohawk, an Indian tribe language) operates on 105.9 and is formally not licensed by the Canadian CRTC. Government authorities have elected not to pursue prosecution of these reservation stations to date but have elected to ignore their presence when assigning licences for non reservation stations. CKWE is located inside the Tyendinaga Mohawk Indian Reserve, CRTC authorised CJPT was recently approved to increase power from 4,000 watts to 24,000 on 105.7, which will create big problems for the reserve station. Their answer - a power increase of their own. The war goes on, Custer was not the only loser.

**TV ratings in Australia** are a new worry for the terrestrial broadcasters. A new method to measure audience shares was launched January 1, with OzTAM replacing the long established ACNielsen service. OzTAM has been installed in 3,000 homes (ACNielsen had 2,500), and uses the most recent technology to determine not only what channel is being watched but by whom. If a TV set remains "on" with no channel changing for an extended period of time, OzTAM flashes a message on the screen, *"Is anybody there?"*. No answer, the box (and TV) are switched off. Concerns about the impact of cable and satellite remain; getting the right mix of 3,000 homes to properly reflect the varied offerings for homes, in the correct percentage to both economic and ethnic balances, is another challenge. Obviously, DVB-T were not the "only new Australian TV boxes" introduced on January 1!

**"Extreme summer weather conditions"** are being blamed by the ABA and broadcasting engineers for disruptions to terrestrial TV reception along coastal regions in NSW and Victoria. The ABA advises, "the problem is caused by two natural phenomena - sunspot activity and 'ducting' - that send television signals thousands of kilometres further than they are meant to travel." Two NSW communities, Ulladulla and Eden, were identified by the ABA as "worst hit." Australian newspapers also report reception along the eastern seaboard from New Zealand TV channels. Sunspots? Not quite; a standard summer period of "Sporadic E" propagation, not unusual, nor newsworthy.